Part 9 · Spot the Mistake

Each solution below reaches a wrong answer, and exactly one step is to blame. Find the first wrong step and rewrite it correctly. Marking other people's work is the fastest way to stop making their mistakes.

🔍 Spot the Mistake

Solving $x^2-45x+324=0$

Step 1. Split $-45x$ as $-36x-9x$, since $(-36)(-9)=324$.

Step 2. $x^2-36x-9x+324=x(x-36)-9(x-36)=(x-9)(x-36)$

Step 3. So the roots are $x=9$ and $x=-36$.

_____ The first wrong step is Step _____ . What should it say?

_____

🔍 Spot the Mistake

Finding the discriminant of $3x^2-2x+\frac{1}{3}=0$

Step 1. Here $a=3, b=-2, c=\frac{1}{3}$.

Step 2. $b^2-4ac=¿$

Step 3. Since $-8<0$, there are no real roots.

_____ The first wrong step is Step _____ . What should it say?

_____

🔍 Spot the Mistake

Deciding if $x(2x+3)=x^2+1$ **is quadratic**

Step 1. LHS $¿ x(2x+3)=2x^2+3x$.

Step 2. Setting LHS $¿$ RHS: $2x^2+3x=x^2+1$, so $x^2+3x+1=0$... wait, subtract incorrectly to get $3x^2+3x-1=0$.

Step 3. It is of the form $ax^2+bx+c=0$, so it is quadratic.

_____ The first wrong step is Step _____ . What should it say?

_____

You can now recognise a quadratic equation in disguise, solve it by factorisation, and — without solving at all — predict how many real roots it has just from the discriminant. That is the whole chapter in one sentence. ✔